



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/552,901

07/26/2006

Perry Peterson

20102-4

6969

1059 7590 11/10/2010  
BERESKIN AND PARR LLP/S.E.N.C.R.L., s.r.l.  
40 KING STREET WEST  
BOX 401  
TORONTO, ON M5H 3Y2  
CANADA

EXAMINER

MEROUAN, ABDERRAHIM

ART UNIT

PAPER NUMBER

2628

MAIL DATE

DELIVERY MODE

11/10/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/552,901	<b>Applicant(s)</b> PETERSON, PERRY	
	<b>Examiner</b> ABDERRAHIM MEROUAN	<b>Art Unit</b> 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/05/2010; 10/06/2010</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/25/2010 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Art Unit: 2628

3. Claims 1-5, 7-11, 14-25, 27-39, and 41-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Wolfram (U.S. Patent 4809202) hereinafter referred as Wolfram, in view of Kevin Sahr et al (NPL: Geodesic Discrete Global Grid Systems) hereinafter referred as Sahr.

4. As per claim 1, Wolfram discloses: A method for storing two-dimensional spatially organized data in one-dimensional space on a computer storage medium, the method comprising: mapping the attributes of continuous state planar space to a multi-resolutional tessellation of close-packed uniform aperture three hexagonal cells (Wolfram, Column 8, lines 44-52, Column 2, lines 35-38, and Column 2, lines 3-5),

Wolfram doesn't disclose: a location of each cell represented by a centroid and a voronoi region created by the boundary with adjacent centroids forming a closed area for which properties of the cell are represented; and uniquely identifying each cell with a sequential number including the identification of a parent cell, the each parent cell at least partially encompassing a cluster of child cells in a spatial hierarchy.

wherein relationships between parent cells and child cells are defined by the following rules:

each parent cell whose centroid is not the centroid for any lower resolution cells defines a

location of a single new child cell of a next highest resolution; and,

each parent cell its whose centroid is also the centroid for any lower resolution cells defines a

location of multiple new child cells of the next highest resolution including, one new child cell at

the centroid of the parent cell and one new child cell located at each vertex of the parent's

boundary edge; and

Art Unit: 2628

during initial conditions, a parent cell is assigned a general hexagon shape or with a starting centroid location that can be considered the planar origin.

However, Sahr discloses: a location of each cell represented by a centroid and a voronoi region created by the boundary with adjacent parent centroids forming a closed area for which properties of the cell are represented ; and uniquely identifying each cell with a sequential number including the identification of a parent cell, the each parent cell at least partially encompassing a cluster of child cells in a spatial hierarchy (Sahr, Page 121, “***Discrete Global Grid***” lines 1-24, Page 122, “***Discrete Global system***”, lines 15-24, and Figure 1)

each parent cell whose centroid is not the centroid for any lower resolution cells defines a location of a single new child cell of a next highest resolution; and, (Sahr, Page 122, “***Discrete Global Grid System***”, Paragraph [0002], lines 4-15)

each parent cell its whose centroid is also the centroid for any lower resolution cells defines a location of multiple new child cells of the next highest resolution including, one new child cell at the centroid of the parent cell (Sahr, Page 122, “***Discrete Global Grid System***”, Paragraph [0002], lines 4-9) and one new child cell located at each vertex of the parent's boundary edge (Sahr, Page 122, “***Discrete Global Grid System***”, Paragraph [0004], lines 18-21); **and**

during initial conditions, a parent cell is assigned a general hexagon shape with a starting centroid location that can be considered the-a planar origin (Sahr, Page 129, “Transformation”, Paragraph [0005], lines 1-13, “***Sadournay et al...***”).

It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Sahr into the process taught by Wolfram, because through such incorporation would provide a detailed description of a discrete global grid systems

5. As per claim 2, Wolfram in view Sahr discloses: A method according to claim 1, wherein the sequential numbers of the cells at each resolution are clustered by parent and ordered according to one of the following methods: sequential ordering, z-curve based ordering, Generalized Balanced Ternary, Gray coding, and hybridized Gray GBT ordering (Sahr, Page 127, right column, lines 27-33, “***Known as Generalized Balanced Ternary...***”).

6. As per claim 3, Wolfram in view discloses: A method according to claim 1, wherein the cell can be modified by one or more of the following procedures: including one or more extra cells, excluding one or more cells, bending, joining, stretching, rotating, scaling and translating (Sahr, Page 132, right column, lines 1-12, “***In particular, we feel...***”).

7. As per claim 4, Wolfram in view Sahr discloses: A method according to claim 1, wherein the sequential numbers can be modified by one or more of the following procedures: adding one or more extra levels, deleting one or more existing levels, and introducing new unique index values (Wolfram, Column 7, lines 19-27).

8. As per claim 5, Wolfram in view Sahr discloses: A method according to claim 1 the method further comprising introducing a new cell at a unique location and a specific resolution wherein an ordering precedence of the new cell supercedes an ordering precedence of neighbor cells and a behavior of the new cell is a behavior of a parent cell whose centroid is also the

Art Unit: 2628

centroid for lower resolution cells (Sahr, Page 122, left column , *Discrete Global Grid System, lines 1-15, “ A discrete global grid...”*)..

9. Claim 7, which is similar in scope to claim 1, is thus rejected under the same rationale.

10. Claim 8, which is similar in scope to claim 2, is thus rejected under the same rationale.

11. Claim 9, which is similar in scope to claim 3, is thus rejected under the same rationale.

12. Claim 10, which is similar in scope to claim 4, is thus rejected under the same rationale.

13. Claim 11, which is similar in scope to claim 5, is thus rejected under the same rationale.

14. As per claim 14, Wolfram in view of Sahr discloses: A system, wherein the system includes software instructions that mathematically convert, georeference and integrate spatial data, raster images, topological georeferenced vectors to a gridded close-packed cell reference for storage in a database or digital file (Sahr, Page 121, right column , lines 6-22, “ Regular DGGs...”)

15. As per claim 15, Wolfram in view of Sahr discloses: A system, wherein the system includes instructions which returns to a computer visualization device a representation of the spatially organized data associated with a spatial area and range of resolutions in the form of a

Art Unit: 2628

whole or partial rendered image of the geodesic globe (Sahr, Page 122, right column , lines 1-9, “ Discrete Global Grid...”)

16. As per claim 16, Wolfram in view of Sahr discloses: A system, wherein the system includes instructions that allow data referenced to the close-packed cell grid to be advertised, shared and transmitted over a network in anyone of: a complete file transfer, a progressively transmitted transfer and a continuous state up dateable transfer (Sahr, Page 127, left column, lines 27-38, “ Studies by GIS researchers...”)

17. As per claim 17, Wolfram in view of Sahr discloses: A system, wherein the system includes instructions that identify on-line data referenced to a cell location as a result of a search query, displaying at an automated or manually set resolution, a pictographic symbol at the cell location on the image of the globe which further instructions provide a means to select this symbol with a cursor, activating further software instructions (Sahr, Page 122, right column, lines 1-9, “ Discrete Global...”)

18. As per claim 18, Wolfram in view of Sahr discloses: A system, wherein the overlapping gridded data structure provides a framework for selecting and extracting data and completion of mathematical routines for spatial integration, analysis and fusion (Sahr, Page 127, left column , lines 27-36, “ Studies by GIS...”).



Art Unit: 2628

19. As per claim 19, Wolfram in view of Sahr discloses: A system, further allowing the spatial addressing and ordering to be used as a mesh or grid for the construction of stochastic and deterministic simulation of dynamic earth events (Sahr, Page 121, left column, lines 17-21, “Application often use...”).whereas the system is arranged such that users can access on-demand in a peer-to-peer environment a multitude of temporal geospatial data at each cell (Sahr, Page 127, left column , lines 27-36, “ Studies by GIS...”).and arranged such that this spatial data can be extracted and utilized in custom defined storage, routing and transformation routines and formulation (Sahr, Page 123, left column , lines 37-39, “ Geodesic DGGSs have...”, and right column, lines 1-20,”store raster... ”)..

20. As per claim 20, Wolfram in view of Sahr discloses: A system, whereas the transformation routines include finite I difference methods (Sahr, Page 129, right column , lines 14-217, “ They can adjusted the grid...”).

21. As per claim 21, Wolfram in view of Sahr discloses: A system, whereas the transformations routines include cellular automata (Sahr, Page 127, left column , lines 20-26, “ A recent textbook...”).

22. Claims 23, 37, which are similar in scope to claim 2, are thus rejected under the same rationale.

Art Unit: 2628

23. Claims 24, and 38, which are similar in scope to claim 3, are thus rejected under the same rationale.

24. As per claim 25, Wolfram in view of Sahr discloses: The method of claim 1, the method further comprising laying the cells of each tessellation onto the faces of an icosahedron and projecting the data from the faces of the icosahedron to a geodesic spheroid (Sahr, Page 124, right column, Figure 3 b-c”).

25. Claims 27, and 41, which are similar in scope to claim 14, are thus rejected under the same rationale.

26. Claims 28, and 42, which are similar in scope to claim 15, are thus rejected under the same rationale.

27. Claims 29, and 43, which are similar in scope to claim 16, are thus rejected under the same rationale.

28. Claims 30, and 44, which are similar in scope to claim 17, are thus rejected under the same rationale.

29. Claims 31, and 45, which are similar in scope to claim 18, are thus rejected under the same rationale.

30. Claims 32, and 46 which are similar in scope to claim 19, are thus rejected under the same rationale.

31. Claims 33, and 47, which are similar in scope to claim 19, are thus rejected under the same rationale.

32. Claims 34, and 48, which are similar in scope to claim 20, are thus rejected under the same rationale.

33. Claims 35, and 49, which are similar in scope to claim 21, are thus rejected under the same rationale.

34. Claims 22, and 36, which are similar in scope to claims 1 and 7, are thus rejected under the same rationale.

35. Claim 39, which is similar in scope to claim 25, is thus rejected under the same rationale.

36. As per claim 50, Wolfram in view of Sahr discloses: The method of claim 1, the method further comprising laying the cells of each tessellation onto the faces of an icosahedron and projecting the data from the faces of the icosahedron to a geodesic spheroid. (Sahr, Page 129, right column, second paragraph.).

37. As per claim 51, Wolfram in view of Sahr discloses: The method of claim 50, wherein a shape, orientation, and projection of the series of hierarchical tessellations conforms to the Icosahedron Snyder Equal Area Aperture 3 Hexagon Grid. (Sahr, Page 130, left column, third paragraph.).

38. Claims 6, 12-13, 26 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Wolfram (U.S Patent 4809202) hereinafter referred as Wolfram, in view of Kevin Sahr et al (NPL: Geodesic Discrete Global Grid Systems) hereinafter referred as Sahr, and further in view of Brueckner et al. (USPG-PUB 2002/0069018 A1) hereinafter referred as Brueckner.

39. As per claim 6, Wolfram in view of Sahr discloses: A method according to claim 1. Wolfram in view of Sahr doesn't disclose: wherein two or more cells may be introduced at any unique locations and specific resolution and wherein the boundary of two or three of the new cells share vertices, such vertices define the location of new child cells and the child cells shall be uniquely indexed with reference to its three shared parents, and the behavior of these child cells are considered as a parent cell for which their centroid location is not a centroid location for any lower resolution cells .However, Brueckner discloses: wherein two or more cells may be introduced at any unique locations and specific resolution and wherein the boundary of two or three of the new cells share vertices, such vertices define the location of new child cells and the

Art Unit: 2628

child cells shall be uniquely indexed with reference to its three shared parents (Brueckner, Page 15, Paragraph[0241], and Figure 25), and the behavior of these child cells are considered as a parent cell for which their centroid location is not a centroid location for any lower resolution cells (Brueckner, Page 16, Paragraph[0261], lines 6-13, and Figure 35).

It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Brueckner into the process taught by Wolfram in view of Sahr, because through such incorporation would provide the resolution at each location of the cells.

40. Claim 12, which is similar in scope to claim 6, is thus rejected under the same rationale.

41. As per claim 13, Wolfram in view of Sahr, and in view of Brueckner discloses: A system, where the shape, orientation and projection conforms to the Icosahedron Snyder Equal Area Aperture 3 Hexagon Grid (Sahr, Page 128, left column , lines 35-38, “ Figure 11 illustrates...” ) and the division of the icosahedron surface begins with the introduction of 12 points, one on each icosahedron vertex, resulting in pentagonal shaped voronoi regions with shared cell vertices located at the center of the icosahedron faces (Sahr, Page 125, left column , lines 9-13, “ Wickman et al. ....” ) , further defining 20 second generation hexagonal cells at each of these shared vertices and 12 second generation pentagonal cells each at the icosahedron's vertices (Sahr, Page 125, left column , lines 9-19, “ Wickman et al...” ).

42. Claims 26, and 40, which are similar in scope to claim 13, are thus rejected under the same rationale.

*Response to Arguments*

43. Applicant's arguments directed to claims 1-51 have been fully considered but they are not persuasive.

44. In response to applicant's argument for claim 1, applicant argues on page 16 that the Applicant notes that: "the method as claimed in claim 1 is directed to incongruent tessellations because the tessellations contains aperture three hexagonal cells."

The prior art Sahr stated that:" Klmerhng et al. (1999) and Clarke (2002) note the importance of regular *hierarchical relationships* between DGGS resolutions in creating efficient data structures. Two types of hierarchical relationship are common. A DGGS is *congruent* if and only if each resolution  $k$  cell region consists of a union of resolution  $k+l$  cell regions. A DGGS is *aligned* if and only if each resolution  $k$  cell point is also a cell point in resolution  $k+l$ . If a DGGS does not have these properties, the system is defined as *incongruent* or *unaligned*. For example, the most widely used DGGS is generated implicitly by multiple precisions of decimal geographic vector representations. This DGGS has an aperture of 10 and is incongruent and aligned (Figure 1)."(Sahr, Page 122, left column, "Discrete Global Grid System").

This mean that Sahr is discloses that the Discrete Global System is incongruent and aligned as it is in Figure 1 on page 122.

Art Unit: 2628

45. In response to applicant's argument for claim 1, applicant argues on page 18 that the Applicant notes that the prior art doesn't disclose: "A method for storing two-dimensional spatially organized data in one- dimensional space on a computer storage medium."

Examiner respectfully disagrees with argument because this limitation teaches only the data is organized in one – dimensional space not stored in a one dimensional memory.

Wolfram discloses: " one cell is represented by a value 1; and any other condition is represented by a value 0. Thus, a six digit binary number also can be used to represent all flow from a cell.

"(Column 2, line 44-51)

This shows that a cells are represented by on value 1 or 0 which is one dimensional.

46. In response to applicant's argument for claim 1, applicant argues on page 19 that the Applicant notes that the prior art Sahr does not disclose:" defining parent-child relationship according the two rules and assigning hierarchical indexes based on that relationship as claimed in the present application." Examiner respectfully disagrees with argument because the applicant claims on page 16 the claim 1 is directed to incongruent, and Sahr discloses on page 122 figure 1 that this figure is an incongruent, aligned hierarchy.

47. The response to the arguments for claim 1 applies to the arguments for claims 7 and 22.

### ***Conclusion***

Art Unit: 2628

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDERRAHIM MEROUAN whose telephone number is (571)270-5254. The examiner can normally be reached on Monday to Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. M./

Examiner, Art Unit 2628

/Andrew Wang/

Supervisory Patent Examiner, Art Unit 2628